



wwPDB X-ray Structure Validation Summary Report ⓘ

May 29, 2020 – 06:37 am BST

PDB ID : 4XLS
Title : Crystal structure of *T. aquaticus* transcription initiation complex with CarD containing upstream fork promoter.
Authors : Bae, B.; Darst, S.A.
Deposited on : 2015-01-13
Resolution : 4.01 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

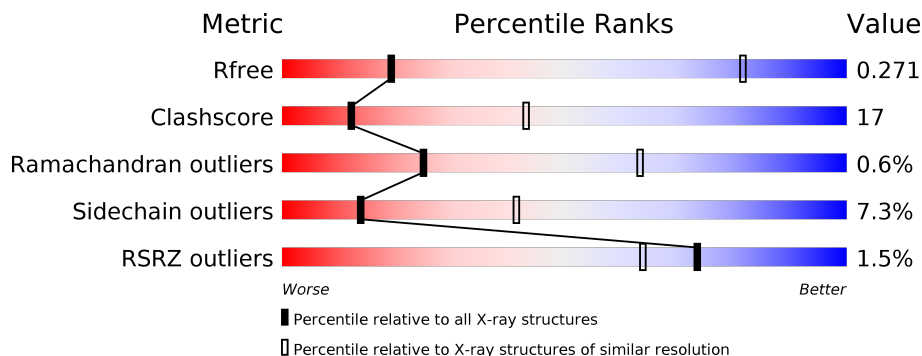
MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.11
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 4.01 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1098 (4.34-3.70)
Clashscore	141614	1159 (4.34-3.70)
Ramachandran outliers	138981	1118 (4.34-3.70)
Sidechain outliers	138945	1108 (4.34-3.70)
RSRZ outliers	127900	1034 (4.38-3.66)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	314	
1	B	314	
1	G	314	
1	H	314	
2	C	1119	
2	I	1119	

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Mol	Chain	Length	Quality of chain
3	D	1524	<p>%</p> <p>57% 36% 5%</p>
3	J	1524	<p>%</p> <p>53% 34% 10%</p>
4	E	99	<p>61% 33% 6%</p>
4	K	99	<p>2%</p> <p>62% 30% 6%</p>
5	F	347	<p>%</p> <p>62% 35%</p>
5	L	347	<p>2%</p> <p>65% 32%</p>
6	M	164	<p>2%</p> <p>67% 30%</p>
6	N	164	<p>4%</p> <p>64% 34%</p>
7	O	30	<p>10%</p> <p>57% 43%</p>
7	R	30	<p>60% 40%</p>
8	P	24	<p>13%</p> <p>63% 38%</p>
8	S	24	<p>75% 21%</p>

2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 58966 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	227	Total	C	N	O	S	0	0	0
			1770	1130	303	334	3			
1	B	227	Total	C	N	O	S	0	0	0
			1770	1130	303	334	3			
1	G	227	Total	C	N	O	S	0	0	0
			1770	1130	303	334	3			
1	H	227	Total	C	N	O	S	0	0	0
			1770	1130	303	334	3			

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	1112	Total	C	N	O	S	0	0	0
			8739	5531	1553	1632	23			
2	I	1112	Total	C	N	O	S	0	0	0
			8739	5531	1553	1632	23			

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	D	1490	Total	C	N	O	S	0	0	0
			11761	7439	2088	2196	38			
3	J	1367	Total	C	N	O	S	0	0	0
			10779	6810	1923	2010	36			

- Molecule 4 is a protein called DNA-directed RNA polymerase subunit omega.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	E	93	Total	C	N	O	S	0	0	0
			768	490	136	138	4			
4	K	93	Total	C	N	O	S	0	0	0
			768	490	136	138	4			

- Molecule 5 is a protein called RNA polymerase sigma factor SigA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	F	345	Total	C	N	O	S	0	0	0
			2787	1758	502	523	4			
5	L	345	Total	C	N	O	S	0	0	0
			2787	1758	502	523	4			

- Molecule 6 is a protein called CarD-like transcriptional regulator.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	M	162	Total	C	N	O	S	0	0	0
			1274	807	234	231	2			
6	N	162	Total	C	N	O	S	0	0	0
			1274	807	234	231	2			

- Molecule 7 is a DNA chain called DNA (30-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	O	30	Total	C	N	O	P	0	0	0
			613	296	109	179	29			
7	R	30	Total	C	N	O	P	0	0	0
			613	296	109	179	29			

- Molecule 8 is a DNA chain called DNA (5'-D(P*GP*CP*AP*CP*AP*AP*TP*TP*TP*AP*AP*CP*AP*CP*TP*TP*TP*TP*GP*TP*CP*AP*AP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	P	24	Total	C	N	O	P	0	0	0
			489	235	86	144	24			
8	S	24	Total	C	N	O	P	0	0	0
			489	235	86	144	24			

- Molecule 9 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	J	2	Total	Zn	0	0
			2	2		
9	D	2	Total	Zn	0	0
			2	2		

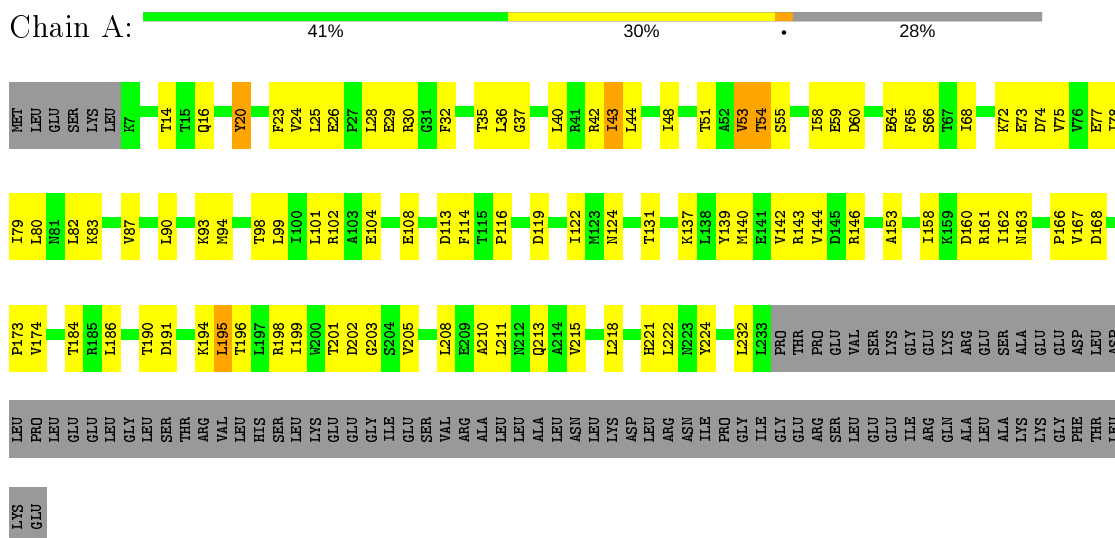
- Molecule 10 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	J	1	Total 1	Mg 1	0	0
10	D	1	Total 1	Mg 1	0	0

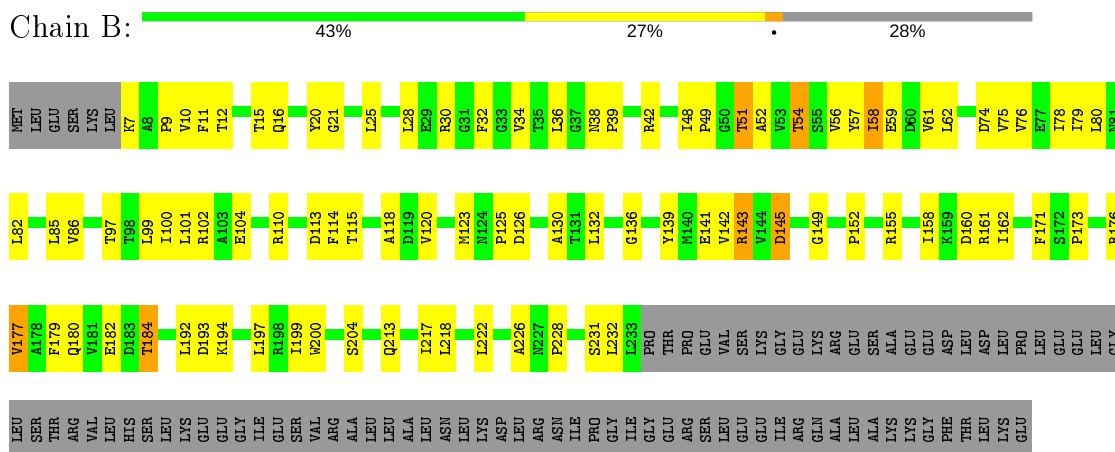
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

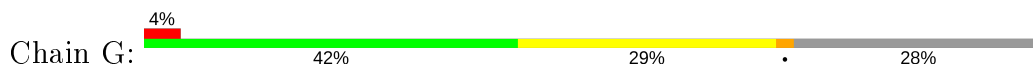
- Molecule 1: DNA-directed RNA polymerase subunit alpha

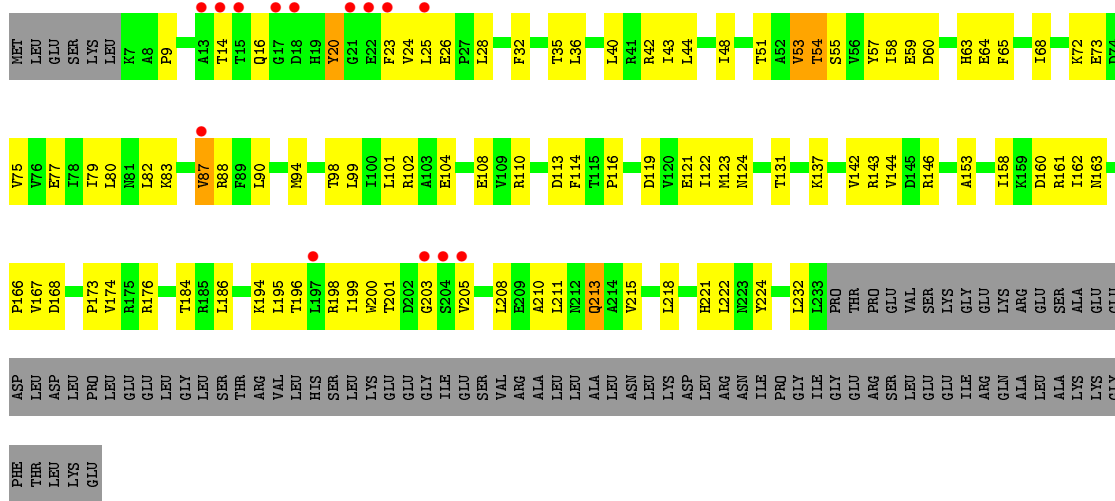


- Molecule 1: DNA-directed RNA polymerase subunit alpha

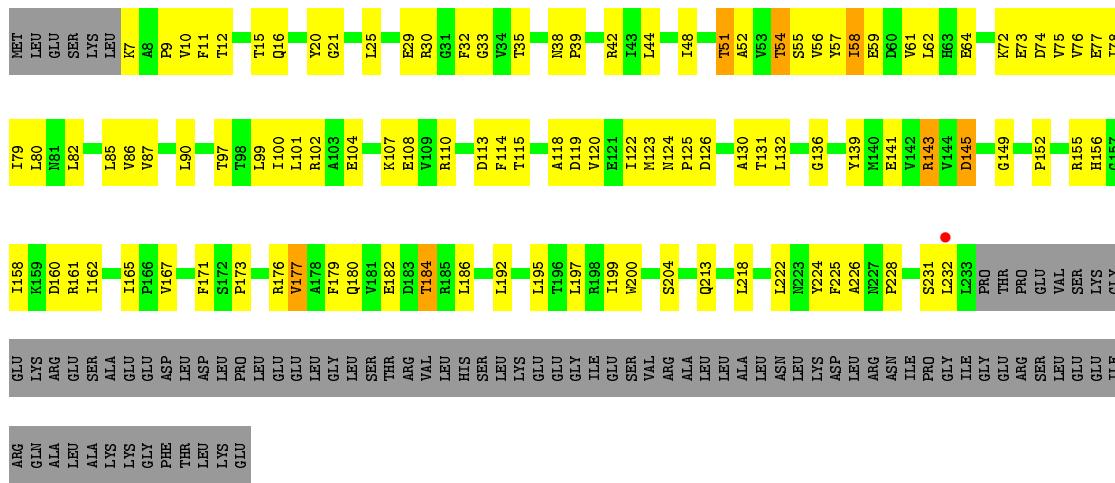
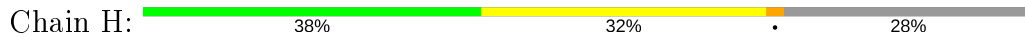


- Molecule 1: DNA-directed RNA polymerase subunit alpha

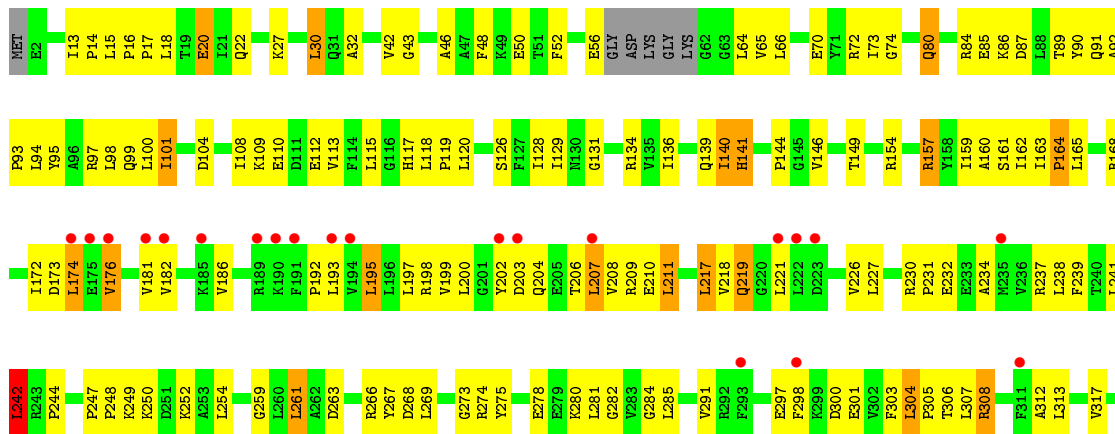


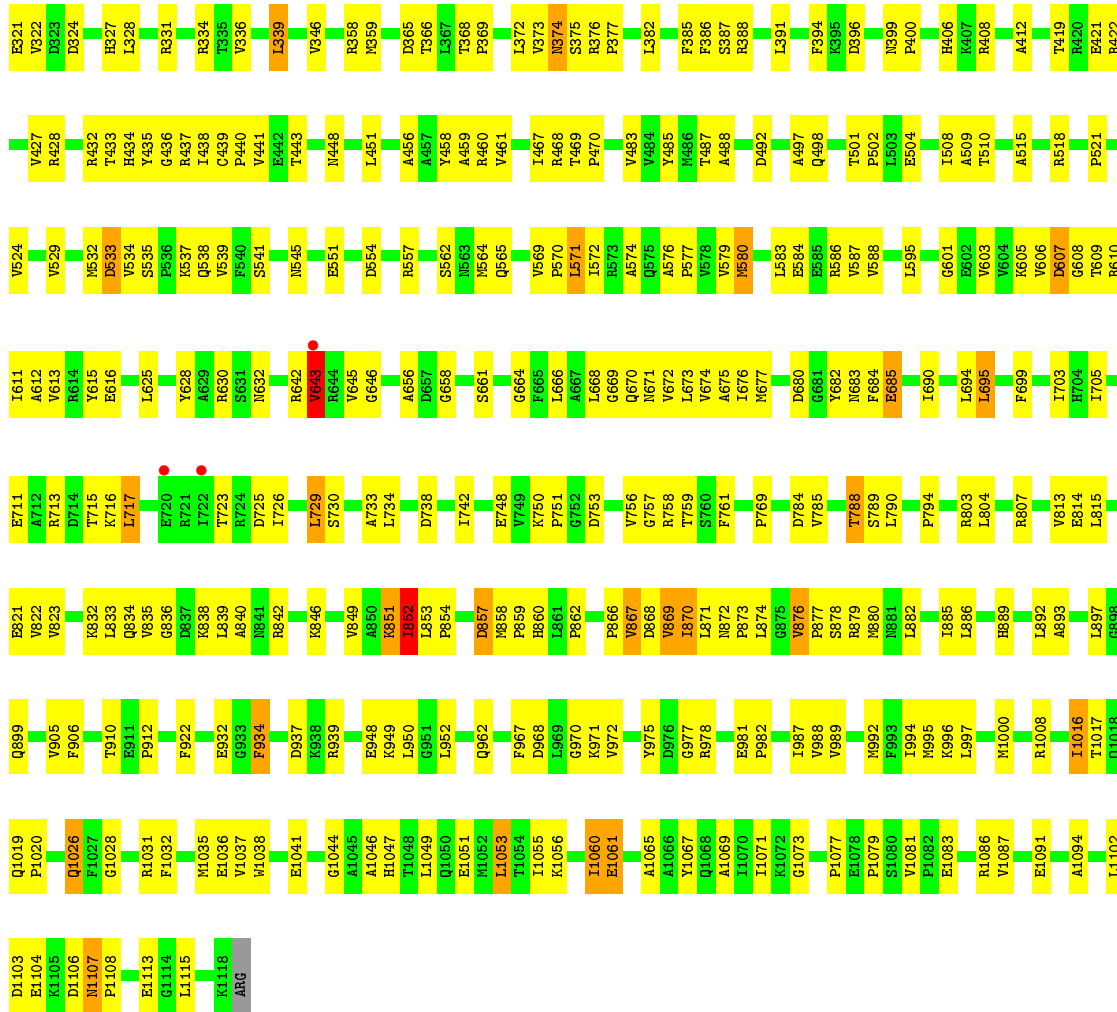


• Molecule 1: DNA-directed RNA polymerase subunit alpha

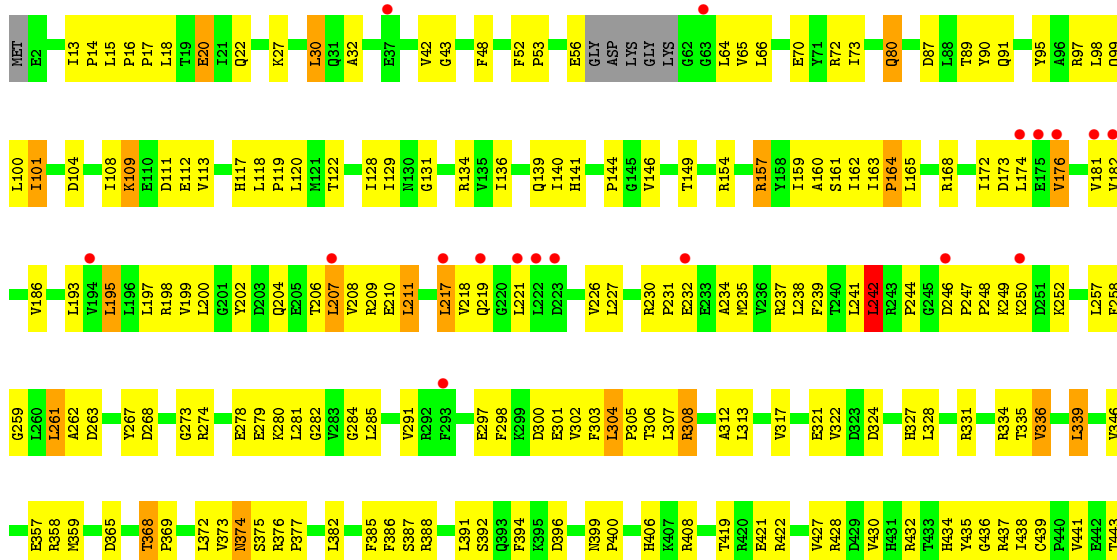


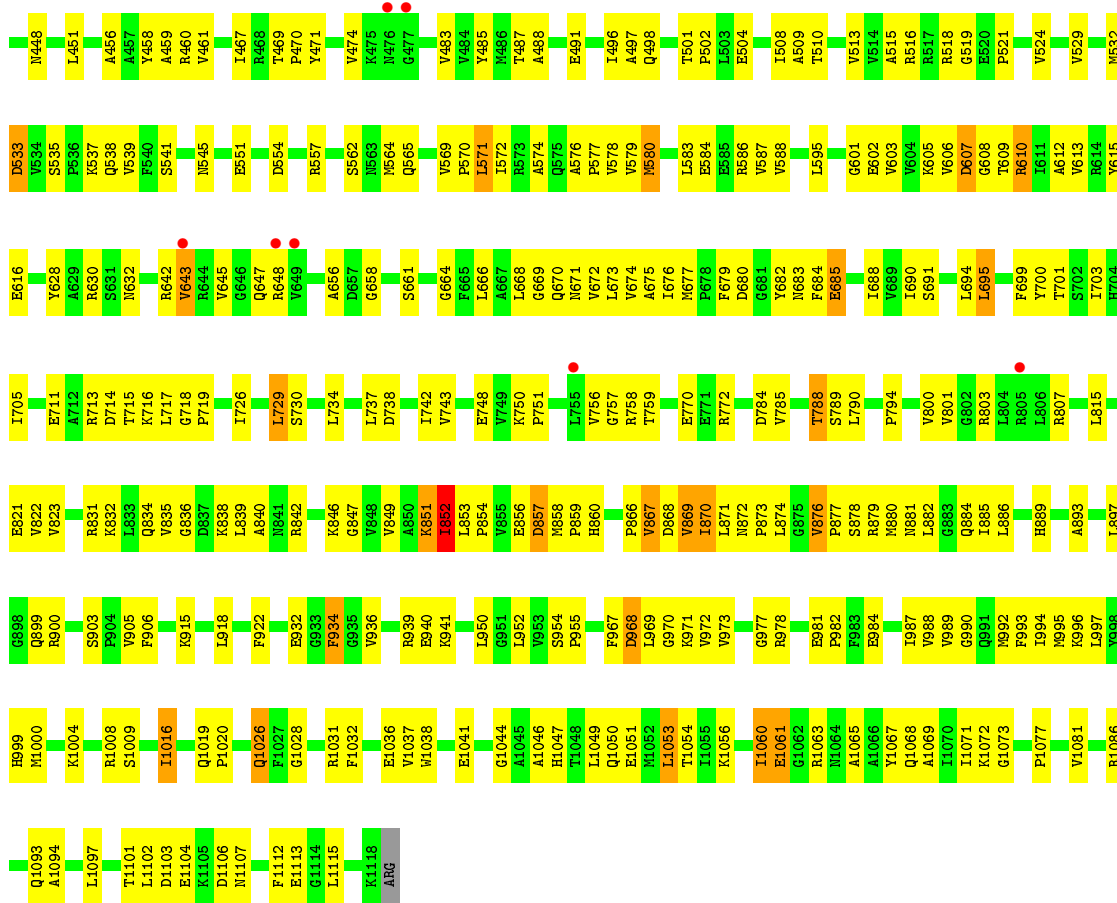
• Molecule 2: DNA-directed RNA polymerase subunit beta



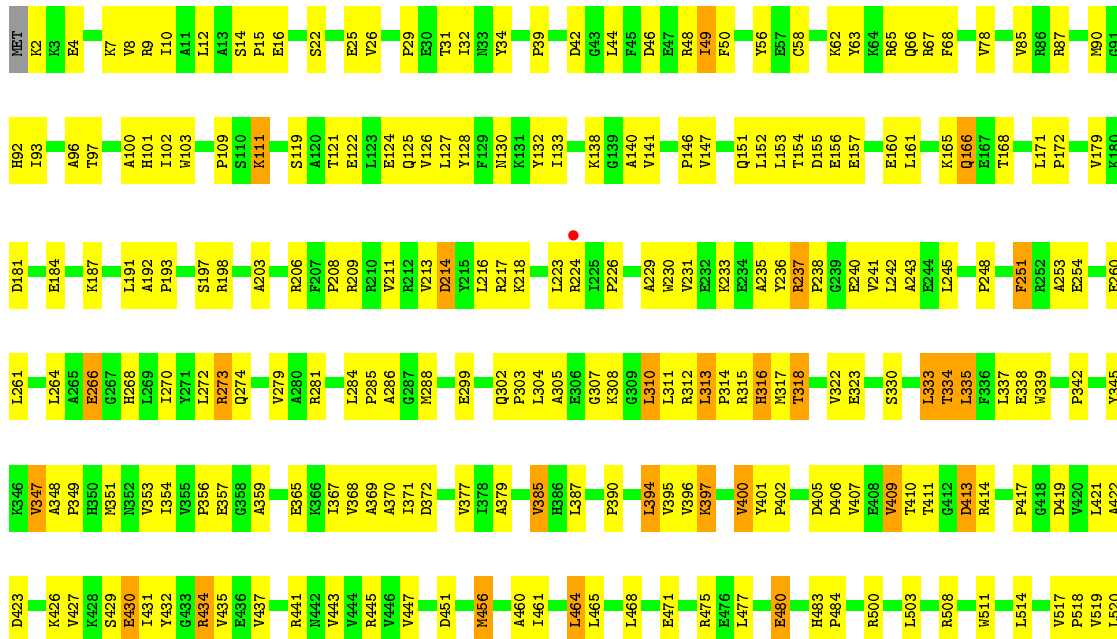


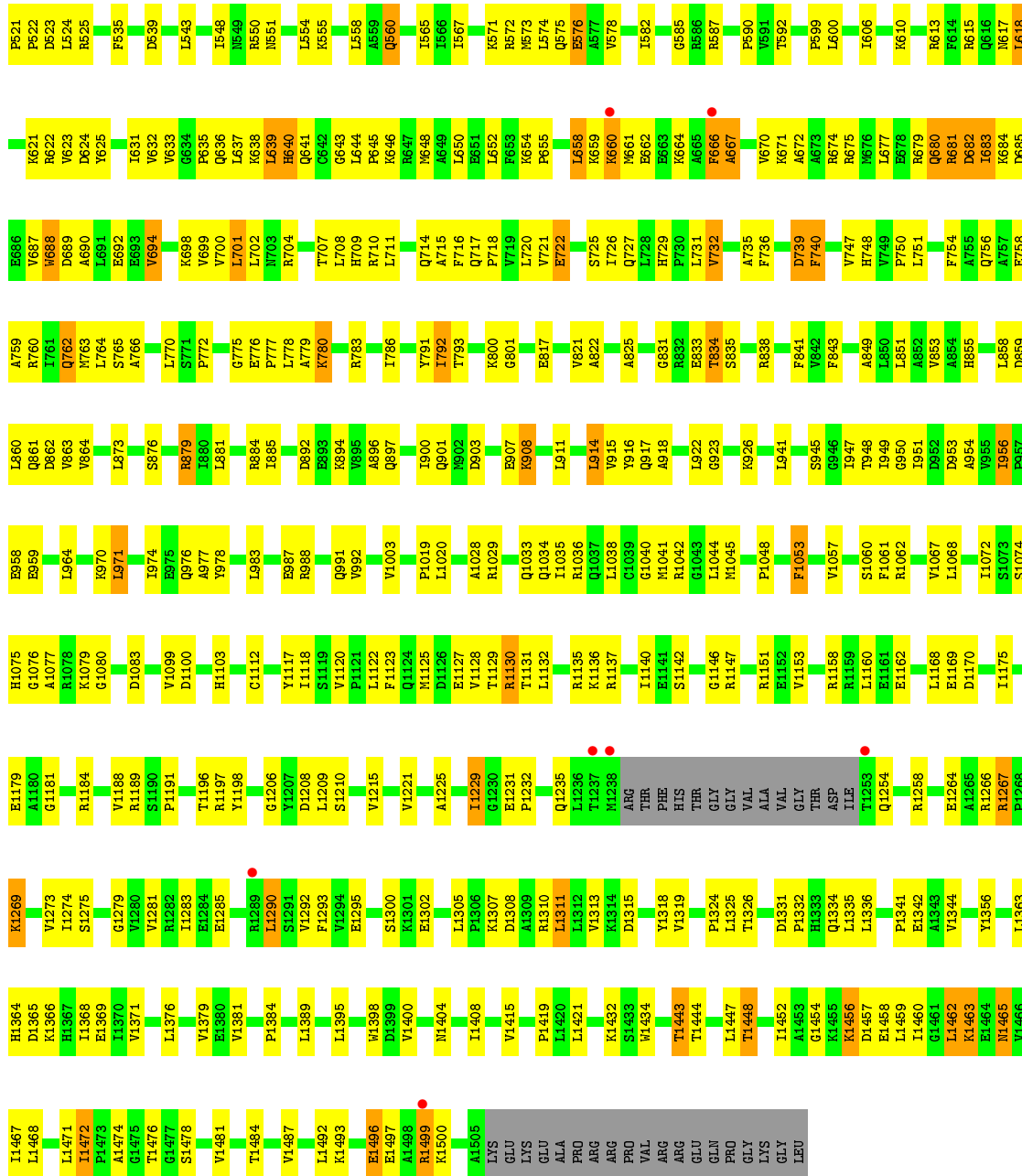
● Molecule 2: DNA-directed RNA polymerase subunit beta



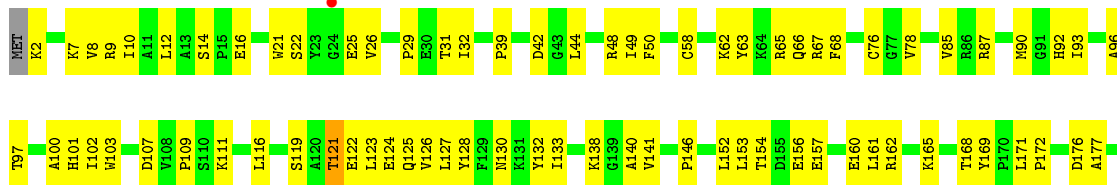


● Molecule 3: DNA-directed RNA polymerase subunit beta'

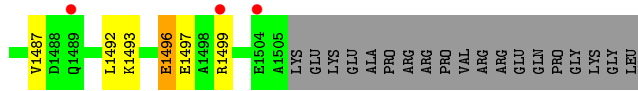




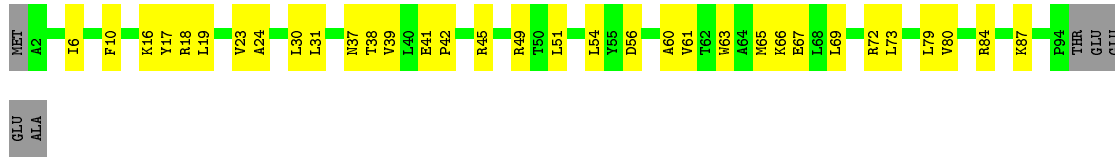
● Molecule 3: DNA-directed RNA polymerase subunit beta'



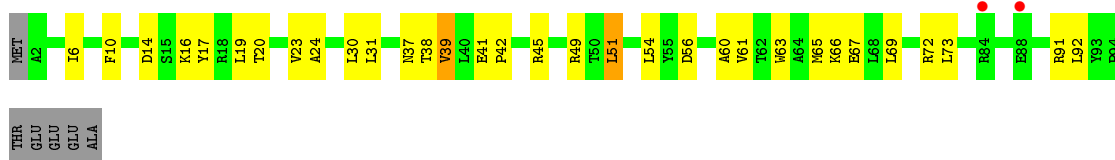
E184	VAL	THR	V986	L503	P590	R689	D739	S835	A918	Y1021	I1118	G1204	E1285	L1389
A192	VAL	ALA	K397	R508	V591	V670	F740	R838	I922	A1028	S1119	I205	R1289	L1390
P193	GLY	LYS	R399	R671	T592	M671	A672	R672	G923	R1029	V1120	G1206	L1290	L1420
R198	LVS	VAL	V400	W511	P599	A673	M924	F841	M924	Q1033	L1422	D1208	S1291	L1395
K199	ASP	GLY	Y401	L600	R601	R674	R675	F843	E925	F1123	F1123	L1209	F1292	L1398
D200	LEU	ALA	F402	L514	R602	M676	M677	F843	K926	Q1034	Q1124	S1210	F1293	D1398
G201	ALA	GLY	F403	E515	S602	M676	L677	A849	Y937	I1036	M125	V1215	V1294	V1400
A202	GLY	GLY	A516	V517	I606	Q630	L751	L850	F750	Q1037	E1126	V1215	E1295	V1400
V203	GLY	GLY	D405	P518	K610	R681	F754	L851	L941	L1038	E1128	V1221	S1300	M1404
A203	HIS	HIS	P518	V519	K610	D682	F755	L851	L941	L1038	E1128	V1221	K1301	M1404
P208	LEU	ASP	V407	V520	R615	D683	Q756	R853	S945	R1042	T1129	A1225	E1302	I1408
R209	ILE	SER	F408	P521	R615	R683	Q756	A854	T948	R1042	T1131	A1226	E1302	V1415
V213	TRP	VAL	T410	P522	R616	R684	A757	R855	T949	R1043	L1132	A1227	L1305	V1415
D214	LEU	LEU	T410	D523	Q616	D685	A758	R855	I949	G1043	L1132	A1227	P1306	V1415
Y215	GLY	THR	R414	L524	N617	R686	A759	R858	L950	L1044	L1132	A1227	P1306	P1419
L216	GLY	LEU	R414	R525	L618	R687	A759	D859	G950	M1045	R1135	I1229	K1307	L1420
ARG	GLY	PHE	L421	F835	K621	V687	Q762	L860	D852	P1048	R1137	E1231	A1309	L1421
LYS	GLY	LEU	A422	R539	R622	D689	M763	Q861	D852	S1060	I1140	Q1235	R1310	K1432
GLY	VAL	LEU	D423	D639	R622	L691	L764	R862	D859	V1057	G1146	L1236	L1312	S1433
ARG	VAL	TRP	K426	D624	R622	E692	A766	R863	I951	I1057	G1146	L1236	V1313	W1434
ALA	ALA	T340	K426	Y625	Y625	E693	A766	R864	I951	I1057	R1147	T1237	K1314	W1434
ALA	ARG	T340	S429	L543	V632	E694	L770	R865	E958	S1060	R1147	T1237	K1314	W1434
LEU	TRP	D844	S429	L543	V633	V694	S771	R867	E959	F1061	R1151	M1442	L1315	M1442
ARG	PHE	V347	V443	I548	V633	R698	P772	R867	E959	R1062	E1152	THR	V1319	T1443
ILE	LEU	V347	V444	R549	G694	R699	P772	R867	E959	R1062	E1152	THR	V1319	T1443
LEU	PRO	PRO	R445	R550	P635	V699	G775	R873	R962	L873	V1153	PHE	V1319	T1444
LEU	ALA	I354	R445	N651	Q636	W700	G775	R874	R962	R874	V1153	PHE	V1319	T1444
SER	GLY	V355	V446	N651	Q636	L701	G775	R874	R962	R874	V1153	PHE	V1319	T1444
ALA	MET	P356	V447	L554	K638	L702	P777	R876	E965	S876	G1157	THR	L1325	L1447
TRP	THR	A359	D451	K655	L639	R793	L778	R884	E965	S876	R1158	GLY	T1326	T1448
VAL	PRO	V361	M456	L558	R640	R704	A779	R879	R969	R879	R1158	GLY	T1326	T1448
LYS	VAL	K361	G457	Q560	C642	K780	K780	R880	K970	S1073	L1160	VAL	D1331	I1452
GLY	GLY	E365	A458	P663	G643	R709	R783	R880	K970	S1073	L1160	VAL	D1331	I1452
ALA	GLY	K366	E459	E564	L644	R710	R783	R884	K971	H1075	E1162	VAL	P1332	A1453
TYR	GLY	K367	A460	R646	P645	L711	I786	R885	R972	G1077	E1162	VAL	P1332	A1453
ARG	ILE	V368	I461	R646	P645	L711	I786	R885	R972	G1077	E1162	VAL	P1332	A1453
PRO	VAL	A369	I461	R646	P645	L711	I786	R885	R972	G1077	E1162	VAL	P1332	A1453
GLY	GLY	A370	L464	I567	A649	Q714	Y791	R892	A977	D1083	E1179	R1253	G1340	E1457
VAL	VAL	D372	L465	I567	A649	Q714	Y791	R892	A977	D1083	E1179	R1253	G1340	E1457
LEU	GLN	E374	L468	K571	L650	R719	A801	R896	L983	T1084	G1181	R1258	V1344	K1462
ALA	PRO	E374	L468	K571	L650	R719	A801	R896	L983	T1084	G1181	R1258	V1344	K1462
GLY	ALA	A379	E471	M573	P655	L720	E817	R900	R988	R1088	R1184	E1264	H1364	E1464
LEU	ALA	E380	E474	M573	P655	L720	E817	R900	R988	R1088	R1184	E1264	H1364	E1464
SER	GLY	A381	R475	Q575	E576	V721	E817	R901	Q991	V1099	V1188	R1266	D1365	M1465
GLY	LYS	E382	E476	Q575	E576	V721	E817	R901	Q991	V1099	V1188	R1266	D1365	M1465
PRO	TYR	V385	L477	D579	V578	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
LEU	GLY	V385	L477	D579	V578	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
ARG	LEU	P390	E480	A580	A577	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
LEU	LEU	P390	E480	A580	A577	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
ALA	ARG	A391	E480	A580	A577	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
GLY	LEU	A391	E480	A580	A577	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
ALA	PRO	A391	E480	A580	A577	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
GLY	ARG	A391	E480	A580	A577	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
LEU	ARG	A391	E480	A580	A577	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
GLY	ARG	A391	E480	A580	A577	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
GLY	ARG	A391	E480	A580	A577	D679	V821	R902	Q991	D1100	S1190	R1267	K1268	V1466
SER	HIS	L394	R500	R587	R587	A667	F736	R917	L1020	Y1117	V1200	I1283	V1381	S1478
GLY	HIS	L394	R500	R587	R587	A667	F736	R917	L1020	Y1117	V1200	I1283	V1381	S1478
		V995			P668									V1481



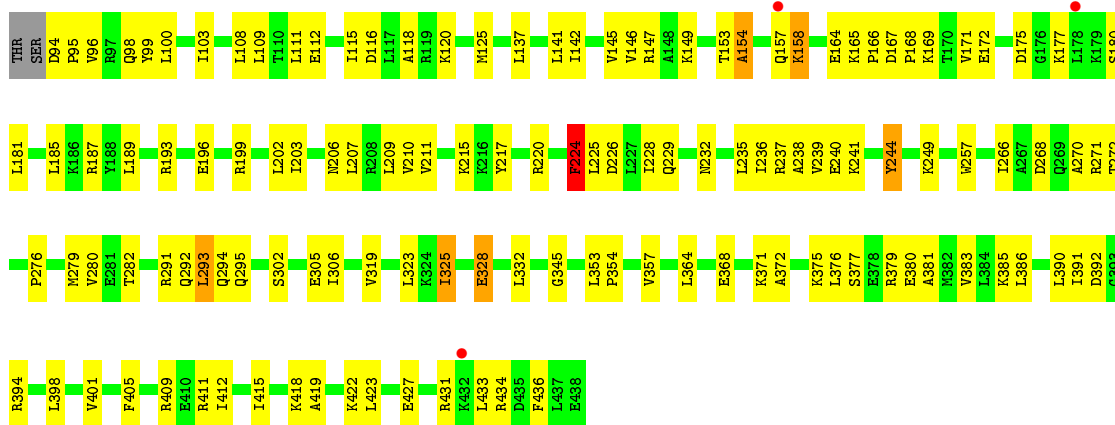
• Molecule 4: DNA-directed RNA polymerase subunit omega



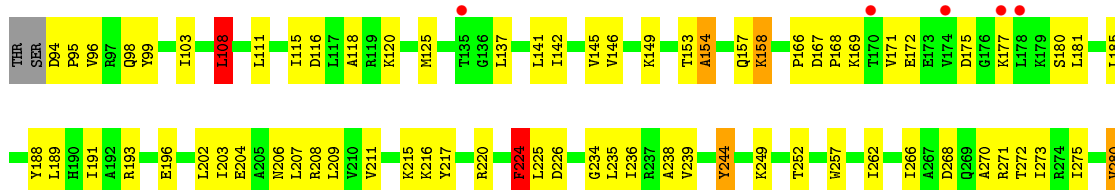
• Molecule 4: DNA-directed RNA polymerase subunit omega

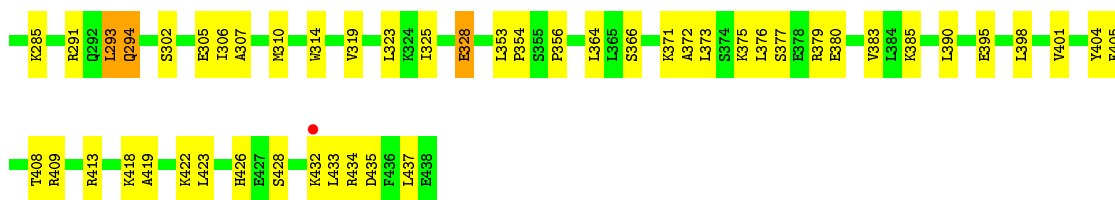


• Molecule 5: RNA polymerase sigma factor SigA

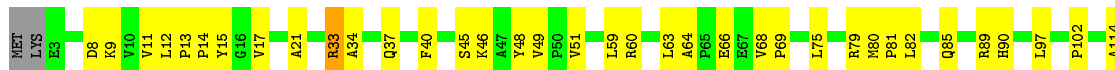


• Molecule 5: RNA polymerase sigma factor SigA





- Molecule 6: CarD-like transcriptional regulator



- Molecule 6: CarD-like transcriptional regulator



- Molecule 7: DNA (30-MER)

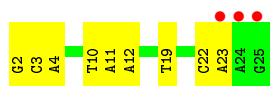


- Molecule 7: DNA (30-MER)



- Molecule 8: DNA (5'-D(P*GP*CP*AP*CP*AP*AP*TP*TP*TP*AP*AP*CP*AP*CP*TP*T P*TP*TP*GP*TP*CP*AP*AP*G)-3')





- Molecule 8: DNA (5'-D(P*GP*CP*AP*CP*AP*AP*TP*TP*TP*AP*AP*CP*AP*CP*TP*TP*TP*TP*GP*TP*CP*AP*AP*G)-3')

Chain S: 75% 21% .



4 Data and refinement statistics

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α , β , γ	293.15Å 293.15Å 539.13Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.79 – 4.01 49.86 – 4.01	Depositor EDS
% Data completeness (in resolution range)	75.7 (49.79-4.01) 75.7 (49.86-4.01)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.79 (at 4.00Å)	Xtrriage
Refinement program	PHENIX (PHENIX.REFINE: DEV_1839)	Depositor
R, R_{free}	0.232 , 0.272 0.232 , 0.271	Depositor DCC
R_{free} test set	7463 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å ²)	146.9	Xtrriage
Anisotropy	0.030	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 190.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.36$, $\langle L^2 \rangle = 0.20$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.87	EDS
Total number of atoms	58966	wwPDB-VP
Average B, all atoms (Å ²)	173.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.80% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.27	0/1804	0.52	0/2455
1	B	0.27	0/1804	0.54	0/2455
1	G	0.27	0/1804	0.52	0/2455
1	H	0.28	0/1804	0.55	0/2455
2	C	0.26	0/8905	0.53	1/12040 (0.0%)
2	I	0.26	0/8905	0.53	1/12040 (0.0%)
3	D	0.27	0/11963	0.52	0/16165
3	J	0.27	0/10959	0.51	0/14802
4	E	0.25	0/783	0.52	0/1054
4	K	0.25	0/783	0.53	0/1054
5	F	0.27	0/2829	0.52	0/3804
5	L	0.27	0/2829	0.53	0/3804
6	M	0.26	0/1302	0.51	0/1765
6	N	0.26	0/1302	0.49	0/1765
7	O	0.46	0/687	1.08	0/1059
7	R	0.46	0/687	1.11	1/1059 (0.1%)
8	P	0.45	0/547	1.13	3/841 (0.4%)
8	S	0.48	0/547	1.18	2/841 (0.2%)
All	All	0.28	0/60244	0.56	8/81913 (0.0%)

There are no bond length outliers.

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	S	25	DG	P-O5'-C5'	-6.14	111.08	120.90
2	I	242	LEU	CA-CB-CG	5.95	128.99	115.30
2	C	242	LEU	CA-CB-CG	5.89	128.85	115.30
7	R	28	DA	O4'-C1'-N9	5.80	112.06	108.00
8	P	19	DT	C5-C4-O4	-5.26	121.22	124.90

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1770	0	1799	75	0
1	B	1770	0	1799	61	0
1	G	1770	0	1799	78	0
1	H	1770	0	1799	74	0
2	C	8739	0	8841	357	0
2	I	8739	0	8841	363	0
3	D	11761	0	11976	449	0
3	J	10779	0	10993	397	0
4	E	768	0	784	27	0
4	K	768	0	784	27	0
5	F	2787	0	2866	86	0
5	L	2787	0	2866	79	0
6	M	1274	0	1288	34	0
6	N	1274	0	1288	39	0
7	O	613	0	343	14	0
7	R	613	0	343	9	0
8	P	489	0	273	7	0
8	S	489	0	273	5	0
9	D	2	0	0	0	0
9	J	2	0	0	0	0
10	D	1	0	0	0	0
10	J	1	0	0	0	0
All	All	58966	0	58955	2002	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 17.

The worst 5 of 2002 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:149:LYS:HB3	5:F:193:ARG:HH12	1.35	0.91

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:204:GLN:HB2	2:I:227:LEU:HD21	1.54	0.90
2:C:502:PRO:HG3	2:C:510:THR:HG22	1.56	0.88
5:L:149:LYS:HB3	5:L:193:ARG:HH12	1.37	0.88
2:C:199:VAL:HA	2:C:231:PRO:HB3	1.55	0.88

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	225/314 (72%)	198 (88%)	26 (12%)	1 (0%)	34	71
1	B	225/314 (72%)	199 (88%)	25 (11%)	1 (0%)	34	71
1	G	225/314 (72%)	200 (89%)	24 (11%)	1 (0%)	34	71
1	H	225/314 (72%)	199 (88%)	25 (11%)	1 (0%)	34	71
2	C	1108/1119 (99%)	980 (88%)	119 (11%)	9 (1%)	19	58
2	I	1108/1119 (99%)	977 (88%)	123 (11%)	8 (1%)	22	61
3	D	1486/1524 (98%)	1333 (90%)	143 (10%)	10 (1%)	22	61
3	J	1361/1524 (89%)	1227 (90%)	126 (9%)	8 (1%)	25	63
4	E	91/99 (92%)	79 (87%)	12 (13%)	0	100	100
4	K	91/99 (92%)	80 (88%)	11 (12%)	0	100	100
5	F	343/347 (99%)	309 (90%)	32 (9%)	2 (1%)	25	63
5	L	343/347 (99%)	309 (90%)	31 (9%)	3 (1%)	17	55
6	M	160/164 (98%)	142 (89%)	18 (11%)	0	100	100
6	N	160/164 (98%)	141 (88%)	19 (12%)	0	100	100
All	All	7151/7762 (92%)	6373 (89%)	734 (10%)	44 (1%)	25	63

5 of 44 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	53	VAL
3	D	683	ILE
3	D	1128	VAL
1	G	53	VAL
3	J	681	ARG

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	194/270 (72%)	184 (95%)	10 (5%)	23 51
1	B	194/270 (72%)	176 (91%)	18 (9%)	9 32
1	G	194/270 (72%)	184 (95%)	10 (5%)	23 51
1	H	194/270 (72%)	176 (91%)	18 (9%)	9 32
2	C	931/936 (100%)	864 (93%)	67 (7%)	14 42
2	I	931/936 (100%)	863 (93%)	68 (7%)	14 41
3	D	1252/1281 (98%)	1139 (91%)	113 (9%)	9 34
3	J	1150/1281 (90%)	1062 (92%)	88 (8%)	13 40
4	E	83/88 (94%)	81 (98%)	2 (2%)	49 69
4	K	83/88 (94%)	79 (95%)	4 (5%)	25 53
5	F	296/299 (99%)	279 (94%)	17 (6%)	20 49
5	L	296/299 (99%)	275 (93%)	21 (7%)	14 42
6	M	131/133 (98%)	127 (97%)	4 (3%)	40 63
6	N	131/133 (98%)	127 (97%)	4 (3%)	40 63
All	All	6060/6554 (92%)	5616 (93%)	444 (7%)	14 41

5 of 444 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	D	1456	LYS
1	H	114	PHE
3	J	1499	ARG

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Mol	Chain	Res	Type
3	D	1497	GLU
5	F	328	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 107 such sidechains are listed below:

Mol	Chain	Res	Type
5	F	263	ASN
1	H	38	ASN
5	L	200	GLN
5	F	269	GLN
1	G	163	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled '#RSRZ > 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q < 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	227/314 (72%)	-0.15	0 100 100	120, 182, 228, 247	0
1	B	227/314 (72%)	-0.29	0 100 100	83, 155, 210, 239	0
1	G	227/314 (72%)	0.33	14 (6%) 20 17	127, 193, 236, 261	0
1	H	227/314 (72%)	-0.13	1 (0%) 92 87	93, 165, 210, 245	0
2	C	1112/1119 (99%)	-0.09	24 (2%) 62 52	70, 174, 245, 303	0
2	I	1112/1119 (99%)	-0.04	25 (2%) 62 52	82, 182, 250, 314	0
3	D	1490/1524 (97%)	-0.17	8 (0%) 91 85	66, 147, 206, 277	0
3	J	1367/1524 (89%)	-0.15	14 (1%) 82 74	70, 153, 211, 274	0
4	E	93/99 (93%)	-0.12	0 100 100	93, 158, 217, 254	0
4	K	93/99 (93%)	0.06	2 (2%) 62 52	106, 166, 222, 247	0
5	F	345/347 (99%)	-0.10	3 (0%) 84 77	108, 179, 259, 323	0
5	L	345/347 (99%)	-0.21	6 (1%) 70 60	119, 184, 260, 323	0
6	M	162/164 (98%)	0.16	3 (1%) 66 58	154, 223, 269, 295	0
6	N	162/164 (98%)	0.47	7 (4%) 35 29	161, 228, 271, 302	0
7	O	30/30 (100%)	0.15	3 (10%) 7 7	139, 200, 269, 277	0
7	R	30/30 (100%)	-0.35	0 100 100	156, 209, 257, 267	0
8	P	24/24 (100%)	0.23	3 (12%) 3 5	162, 229, 257, 280	0
8	S	24/24 (100%)	-0.47	0 100 100	173, 222, 252, 265	0
All	All	7297/7870 (92%)	-0.09	113 (1%) 73 64	66, 168, 242, 323	0

The worst 5 of 113 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	I	221	LEU	5.7
2	I	182	VAL	5.1
1	G	13	ALA	4.6

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Mol	Chain	Res	Type	RSRZ
2	C	175	GLU	4.6
6	N	119	ARG	4.3

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
10	MG	J	2003	1/1	0.88	0.29	219,219,219,219	0
9	ZN	J	2001	1/1	0.93	0.20	200,200,200,200	0
9	ZN	D	2002	1/1	0.94	0.14	203,203,203,203	0
10	MG	D	2003	1/1	0.95	0.27	198,198,198,198	0
9	ZN	D	2001	1/1	0.97	0.13	96,96,96,96	0
9	ZN	J	2002	1/1	0.97	0.06	242,242,242,242	0

6.5 Other polymers [i](#)

There are no such residues in this entry.